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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/945,295	08/31/2001	Gregory S. Pettitt	TI-28576	2019

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TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER

HUNG, YUBIN

ART UNIT PAPER NUMBER

2624

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/945,295

Applicant(s)

PETTITT, GREGORY S.

Examiner

Yubin Hung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-13,16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4-13,16 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/19/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/23/06 has been entered.

Response to Amendment/Arguments

2. Claims 2, 3, 14, 15, 17 and 19-23 have been cancelled. Claims 1, 4-13, 16 and 18 are still pending.
3. In view of Applicant's amendment, the objection to claim 9 has been withdrawn.
4. In view of Applicant's cancellation, the 35 USC § 112 rejections of claims 19-23 have been rendered moot.

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5. Applicant's cancellation has rendered moot the 35 U.S.C. 103 rejections of claims 1, 4-13, 16 and 18. However, upon further consideration, a new ground(s) of rejection is made in view of Kunzman et al. (US 6,054,832).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 4, 5, 10, 12, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and in view of Ito et al. (US 6,388,674) and Kunzman et al. (US 6,054,832).

8. Regarding claim 1, Oguchi discloses

- Providing at least two projectors [Fig. 1, numerals 2 (projectors), 8 (Processing unit); Col. 5, lines 38-56. Note that each processing unit is considered part of the projector since they are coupled to each other]
- communicating each projector's chromaticity data to a main controller [Fig. 1, refs 4 & 5 (considered a controller composing refs. 6 and 7); Figs. 2 & 3; Col. 5, lines 46-50; Col. 9, lines 6-23. Note that the chromaticity sensors send chromaticity data of their respective projector to a main controller]
- determining a standard color gamut achievable by each projector [Col. 3, lines 8-10; Col. 7, lines 41-60, especially lines 55-60. Note that the common color production region correspond to a standard gamut of the projectors]

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- calculating color correction data for each projector based on that projector's chromaticity data and on said standard color gamut [Col. 6, line 1 through Col. 8, line 40, especially Equations 1-10. Note that M_{nt} corresponds to the color correction data of the n^{th} projector]
- calculating image pixel values based on input image data and said color correction data [Col. 7, Eq. 7]

Oguchi does not expressly disclose that each projector has chromaticity data of and luminance data (relative luminance of colors) generated by of that projector stored therein and that the luminance data is also communicated to the main controller to calculate color correction.

However, Kunzman discloses storing information (relative luminance of colors in this case) needed for device color correction in that device. [Fig. 6, Col. 9, line 34-Col. 11, line 2, especially Col. 10, lines 20-23 and 65-67. Note that the PWM's are considered relative luminance of colors.]

Oguchi and Kunzman are combinable because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Oguchi with the teachings of Kunzman by storing information needed for color correction (such as each projector's chromaticity data and the luminance data) in that projector and send both kinds of data to the controller to calculate color correction data. The motivation would have been to be able to allow automated calculation of color

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correction data (because the controller can obtain chromaticity data from a projector connects directly, instead of having to have someone to enter it) and save cost (by not having to have a separate set of chromaticity sensors). Additionally, since relative luminance can affect color quality (see Kunzman, Col. 9, lines 42-44), it would have been obvious to also take them into consideration when calculating color correction data in order to achieve better image matching results.

Therefore, it would have been obvious to combine Kunzman with Oguchi to obtain the invention of claim 1.

9. Regarding claims 4, 5 and 10 Kunzman further discloses

- (claim 4) each said projectors include spatial light modulators at which light is directed from a light source through a rotating color wheel and wherein said stored luminance data for a projector represents effective light times of each color of a color wheel for that projector relative to a base wheel rate
[Fig. 1, refs. 18, 26 & 28; Col. 10, lines 20-23 & 65-67]
- (claim 5) adjusting the gain of the color correction data based on the luminance data
[Fig. 6; Col. 9, line 34-Col. 11, line 2]
- (claim 10) generating images using a spatial light modulator
[Fig. 1]

10. Regarding claim 12, the combined invention of Oguchi and Kunzman further discloses

- at least two projectors
[Oguchi: Fig. 1, numerals 2 (projectors), 8 (Processing unit); Col. 5, lines 38-56. Note that each processing unit is considered part of the projector since they are coupled to each other]
- each projector comprising a spatial light modulator and a memory
[Kunzman: Fig. 4; Fig. 6; Co. 10, line 65-Col. 11, line 2. See also the analyses of claims 1 and 4]

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- a main controller coupled to the projectors, receives chromaticity and luminance data, have circuitry to generate color correction data and communicate corrected pixel value to the projector [Fig. 1, refs 4 & 5 (considered a controller composing refs. 6 and 7); Figs. 2 & 3; Col. 5, lines 46-50; Col. 9, lines 6-23.; Col. 6, line 1 through Col. 8, line 40, especially Equations 1-10; Col. 7, Eq. 7. Note that M_{nt} corresponds to the color correction data of the n^{th} projector. See also the analysis of claim 1]

11. Regarding claim 13, Kunzman further discloses a light source and a color wheel disposed as recited. In addition, **Official Notice** is taken that using a digital micro mirror device for a projector is well known and widely used in the art [e.g., Texas Instrument's digital light processing (DLP)-based projectors that have been available since around 1987].

12. Claim 16 is similarly analyzed and rejected as per the analyses of claims 4 and 12.

13. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Kunzman et al. (US 6,054,832) as applied to claims 1, 4, 5, 10, 12, 13 and 16 above, and further in view of Noguchi (US 6,101,272).

14. Regarding claim 6, the combined invention of Oguchi and Kunzman discloses all the limitations of its parent, claim 1.

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The combined invention of Oguchi and Kunzman does not expressly disclose

- the step of communicating each projector's chromaticity data is performed by communicating the data in the form of a transfer function matrix

However, Noguchi discloses performing gamut transformation and color correction (i.e., chromaticity data) using matrix operations [Col. 29, lines 39-44] and therefore teaches/suggests communicating the data in the form of a transfer function matrix.

The combined invention of Oguchi and Kunzman is combinable with Noguchi because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Kunzman with the teachings of Noguchi by communicating the chromaticity data in the form of a transfer function matrix. The motivation would have been to be because it is a compact form to represent the data and matrix operations can be easily implemented.

Therefore, it would have been obvious to combine Noguchi with Kunzman and Oguchi to obtain the invention of claim 6.

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15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Kunzman et al. (US 6,054,832) as applied to claims 1, 4, 5, 10, 12, 13 and 16 above, and further in view of Yoshikuni (JP 02-001351, with English abstract).

16. Regarding claim 7, the combined invention of Oguchi and Kunzman discloses all the limitations of its parent, claim 1.

The combined invention of Oguchi and Kunzman does not expressly disclose

- the chromaticity data is calculated from primary and white color values

However, Yoshikuni teaches performing color correction on primary and white colors [English abstract: Constitution, lines 8-12]

The combined invention of Oguchi and Kunzman is combinable with Yoshikuni because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Kunzman with the teachings of Yoshikuni by calculating chromaticity data from primary and white colors. The motivation would have been to be because the input has been in R, G, and B (primary colors) and that correcting white color can extend the dynamic range of the output device when producing a color near white.

Therefore, it would have been obvious to combine Yoshikuni with Kunzman and Oguchi to obtain the invention of claim 7.

17. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Kunzman et al. (US 6,054,832) as applied to claims 1, 4, 5, 10, 12, 13 and 16 above, and further in view of Appel (US 5,337,410).

18. Regarding claims 8 and 9, the combined invention of Oguchi and Kunzman discloses all the limitations of their parent, claim 1.

The combined invention of Oguchi and Kunzman does not expressly disclose

- (claim 8) said determining and calculating color correction data steps performed by at least one component selected from the group consisting of: a processing system in data communication with each other, and at least one projector functioning at least partially as the main controller
- (claim 9) said determining and calculating color correction data steps (are) performed by one of said projectors

However, Appel discloses a multi-processor system in which a processing unit also acts as a master (i.e., a controller, and note that in Oguchi the controller performs the determining and calculating steps) [Col. 2, lines 10-12].

The combined invention of Oguchi and Kunzman is combinable with Appel because they have aspects that are from the same field of multi-processing.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Kunzman with the teachings of Appel by having one of the processing units act as the main controller. The motivation would have been to reduce the system cost.

Therefore, it would have been obvious to combine Appel with Oguchi and Kunzman with to obtain the inventions of claims 8 and 9.

19. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Kunzman et al. (US 6,054,832) as applied to claims 1, 4, 5, 10, 12, 13 and 16 above, and further in view of Gibson (US 5,253,043).

20. Regarding claim 11, the combined invention of Oguchi and Kunzman discloses all the limitations of its parent, claim 1.

The combined invention of Oguchi and Kunzman does not expressly teach/suggest calculating color correction data from both primary and secondary colors. However, this limitation is taught by Gibson [Fig. 1; numeral 51; Col. 7, lines 52-66].

The combined invention of Oguchi and Kunzman is combinable with Gibson because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Kunzman with the teachings of Gibson by deriving color correction from both primary and secondary color. The suggestion/motivation would have been to provide more accurate color correction so that better image can be obtained.

Therefore, it would have been obvious to combine Gibson with Oguchi and Kunzman to obtain the invention of claim 11.

21. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oguchi et al. (US 6,340,976) and Kunzman et al. (US 6,054,832) as applied to claims 1, 4, 5, 10, 12, 13 and 16 above, and further in view of Gibson (US 5,253,043).

22. Regarding claim 18, the combined invention of Oguchi and Kunzman discloses all limitations of it parent, claim 12.

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The combined invention of Oguchi and Kunzman does not expressly teaches/suggests deriving color correction data from both primary and secondary colors. However, this limitation is taught by Gibson [Fig. 1; numeral 51; Col. 7, lines 52-66].

The combined invention of Oguchi and Kunzman is combinable with Gibson because they both have aspects that are from the same field of endeavor of color correction.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combined invention of Oguchi and Kunzman with the teachings of Gibson by deriving color correction from both primary and secondary color. The motivation would have been to provide more accurate color correction so that better image can be obtained.

Therefore, it would have been obvious to combine Gibson with Oguchi and Kunzman to obtain the invention of claim 18.

Contact Information

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
April 05, 2006

JINGGE WU
PRIMARY EXAMINER

A large, stylized handwritten signature in black ink is written over the printed name and title of the examiner. The signature is fluid and extends across the right side of the page.